

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-90 are currently pending in this case. No new matter is added.

In the outstanding Official Action, Claims 1-90 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ury (U.S. Patent No. 4,802,178).

The Official Action states that Ury discloses all elements of the Claims 1-90 with the exception of a multilayer film, which the action states would have been an obvious modification to one of ordinary skill in the art at the time of the invention to arrive at the Applicant's claims. Applicants respectfully traverse this rejection.

Claim 1 recites, *inter alia*, a semiconductor laser device comprising:

“...a multi-layer film including a gold thin film mounted on the carrier... the semiconductor laser element and the temperature measuring element are placed in a proximity to facilitate a transfer of heat from the laser element p-side to the measuring element second-side without use of a submount.”

Ury describes a module for receiving a microwave frequency signal which modulates a laser for transmitting a high frequency optical signal.<sup>1</sup> Ury indicates that the module has a pair of trenches (37), which have been diamond sawed across the laser substrate and the trenches isolate the area where the optical fiber is secured to the substrate from the laser diode and its leads, also isolating the thermistor. The trenches provide thermo-isolation during soldering, and serve as a barrier to solder flux to avoid damaging the laser diode.<sup>2</sup>

The basic requirements for a *prima facie* case of obviousness are (1) there must be some suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the

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<sup>1</sup> Ury at column 1, lines 5-7.

<sup>2</sup> Ury at column 3, line 33-40.

reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art reference must teach or suggest all of the claim limitations.

In an exemplary embodiment, the invention relates to a semiconductor laser device in which a semiconductor laser element and a temperature measuring element are joined to a carrier. The semiconductor element and temperature measuring element are arranged proximately to one another so that the dimension of the heat conducting path between the two components is decreased. Moreover, the laser element and the temperature measuring element are joined to the carrier through a multi-layer film. The film serves to decrease the heat resistance of the heat conducting path between the two components. In this way the temperature measuring element can more accurately and quickly detect the temperature of the semiconductor laser element and prevent the deterioration of the optical output and service life of the semiconductor laser element.<sup>3</sup>

The prior art fails to teach or suggest all the claim limitations. Claim 1 states that the semiconductor laser element and the temperature measuring element are placed in a proximity to facilitate a transfer of heat from the laser element to the measuring element. Ury shows that there are two trenches between the semiconductor laser (32) and the thermister (28), and that a distance between the two devices is necessary by this arrangement.<sup>4</sup> Ury explicitly teaches away from the arrangement recited in Claim 1 by creating trenches that purposely thermo-isolate the components. Thus, adding a multi-layered film to Ury would not provide additional functionality or serve any purpose in Ury's device.<sup>5</sup>

"A reference may be said to teach away when a person of ordinary skill in the art, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the

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<sup>3</sup> Application at page 26, lines 11-14.

<sup>4</sup> Ury Figure 2.

<sup>5</sup> Ury at column 3, lines 33-40.

applicant." *In re Gurley*, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994). To this end, "disclosures in the references that diverge from and teach away from the invention cannot be disregarded", Phillips Petroleum Company v. U.S. Steel Corp., 9 USPQ2d 1461 (Fed. Cir. 1989).

Accordingly, Ury does not disclose or render obvious the concept of placing the laser and the temperature devices in proximity to one another, but in fact teaches away from this arrangement.

Moreover, Ury provides no suggestion or motivation to add a multi-layered film to his device as asserted in the Official Action. One feature of the multi-layered film of the exemplary embodiment provides a decreased resistance in the heat conducting path between the laser and the temperature detecting module. Accordingly, Claim 1 patentably defines over Ury.

For substantially similar reasons provided above with regard to Claim 1, it is respectfully submitted that independent Claims 15, 30, 41, 51, 59, 62, 65, 68, 71, 73, and 82 also patentably define over Ury.

Additionally, the Official Action fails to address several limitations disclosed in various dependent claims.

Specifically, Claims 10, 23, 38, 47, and 56 disclose that the resonator length of the semiconductor laser element is equal to or greater than 1,000  $\mu\text{m}$ . Ury fails to teach or suggest this more detailed aspect of the invention.

Claims 7, 30, 65, 75, and 84 describe that the carrier comprises a conductor rod with a thermal conductivity higher than a thermal conductivity of the carrier. Ury fails to teach or suggest this more detailed aspect of the invention.

Claims 2, 31, 60, 66, 74, and 83 all disclose that the carrier comprises at least one of Si, AlN, diamond and cBN polycrystal material. Ury fails to disclose such a limitation.

Claims 16, 37, 42, 51, 63, 69, 71, 77, 80, 86, and 89 recite that the submount comprises a diamond. Ury fails to teach or suggest this more detailed aspect of the invention.

Finally, as Applicants have not amended the claims in response to any rejection on the merits, Applicants submit that a further rejection of these claims based upon newly cited prior art in the next communication, **cannot properly be considered a Final Office Action**.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that Claims 1-90 patentably distinguishing over the prior art. The present application is therefore believed to be in condition for formal allowance and an early and favorable consideration of the application is therefore requested.

Respectfully submitted,

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